

Fig. 1

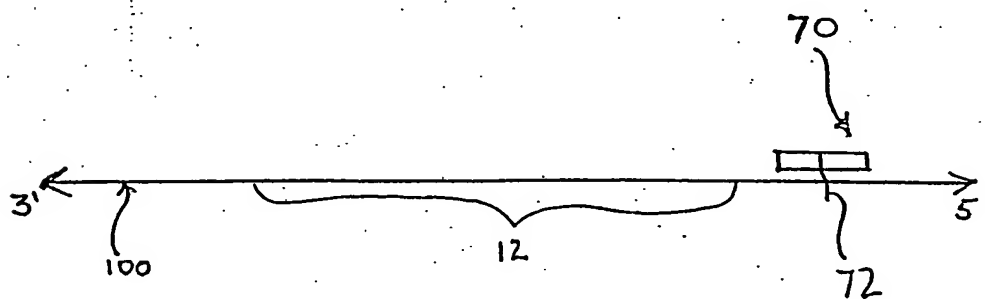


Fig. 2A

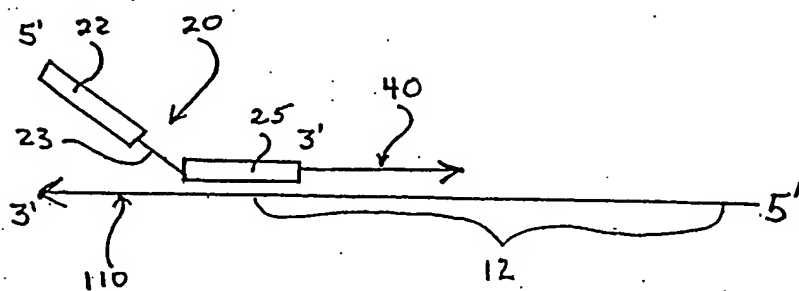
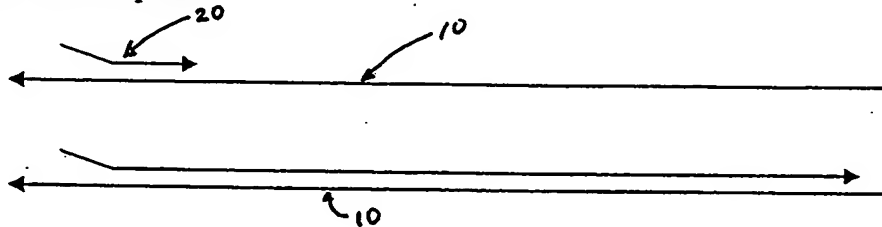


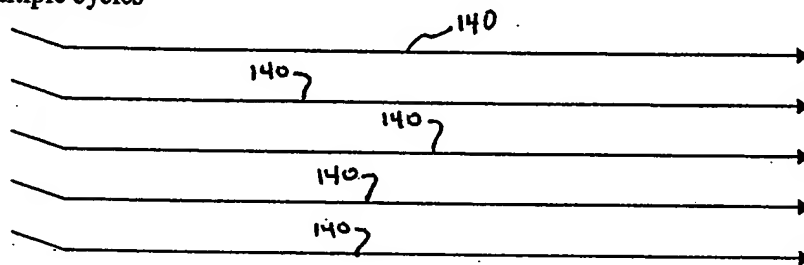
Fig. 2B

Fig. 3

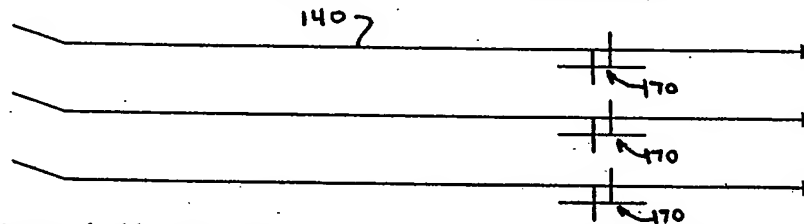
2nd strand cDNA synthesis on 1st strand cDNA by a primer that has a first portion that hybridizes to the variable region of an antibody gene and a second portion with a predetermined sequence



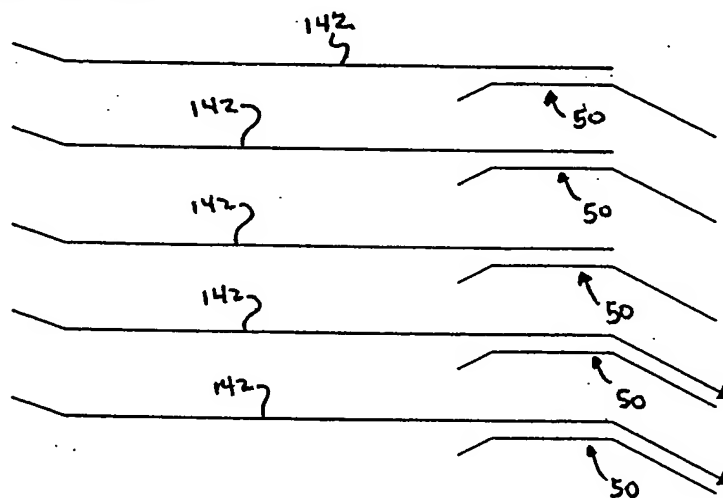
Repeat multiple cycles



Hybridize a restriction oligonucleotide on the desired position in the constant region of an antibody gene and digest with an appropriate restriction enzyme (RED)



Heat denature and add nested oligo nucleotide and perform nested oligonucleotide extension reaction (NOER)



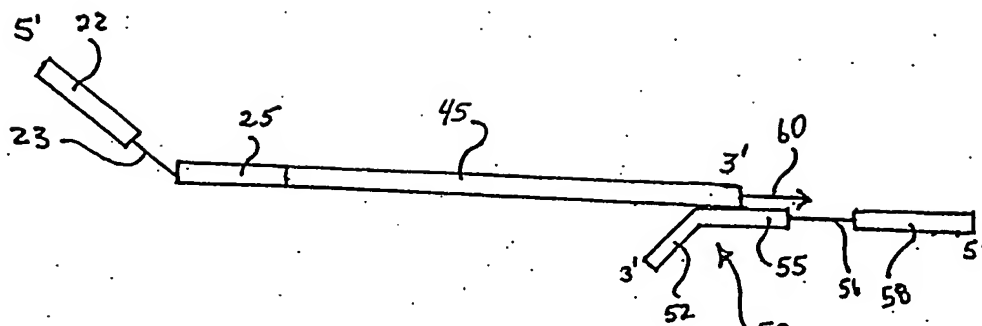


Fig. 4

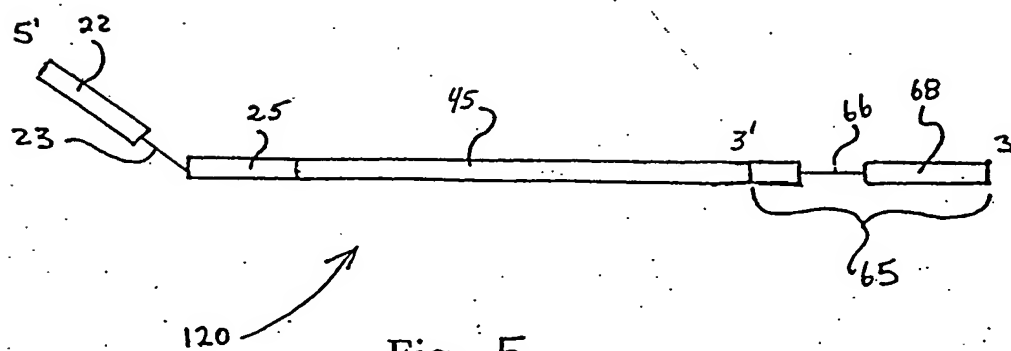
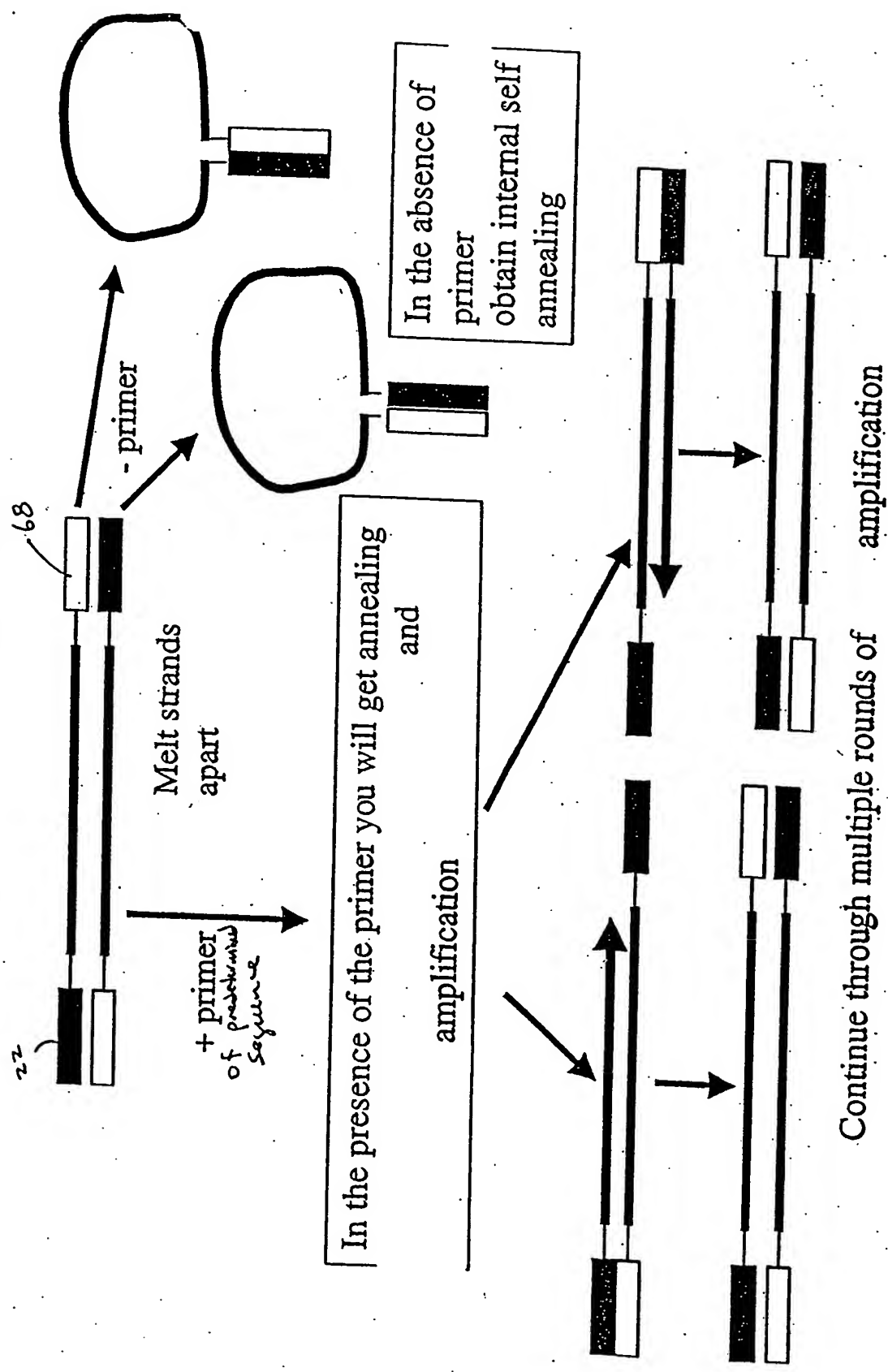


Fig. 5

Figure 6. Single primer amplification



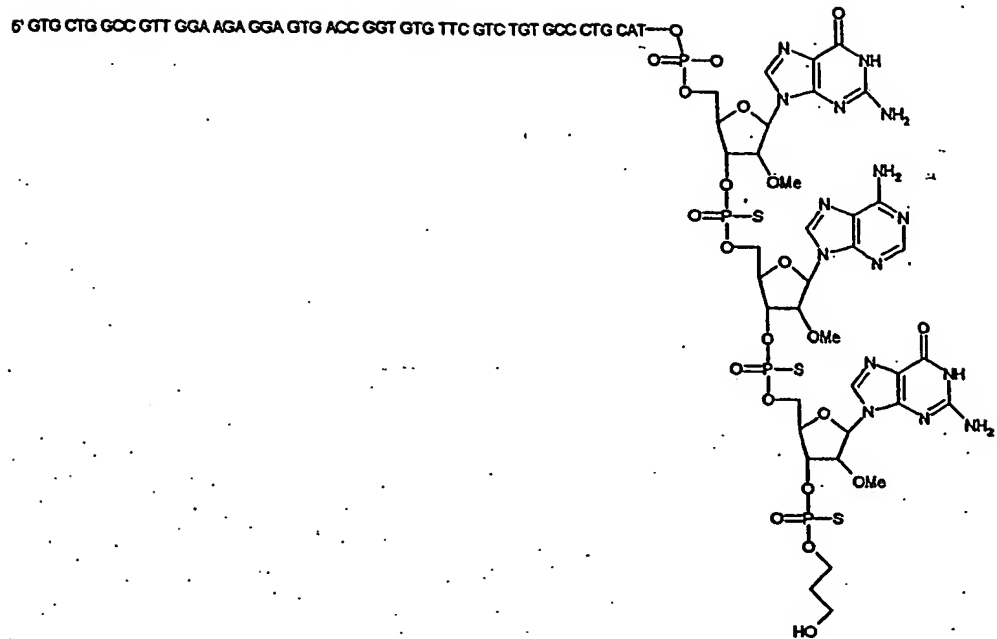


Fig. 7

IgG kappa clones

Heavy chain

| Fab | framework 1 | CDR1 | framework 2 | CDR2 |
|---------|---------------------------------|---------|----------------|---------------------|
| HPAXK1a | EVQLVSGGGLVQPGSLRLSCAASGFTFG | S--YTMN | WVROAPGKLEWIS | YIST--TSSSIYADSVKG |
| HPAXK1b | Q...L...V...T...T... | --- | --- | ---VH3 |
| HPAXK1c | Q...L...V...T...T... | --- | --- | ---VH3 |
| HPAXK1d | Q...L...V...T...T... | --- | --- | ---VH3 |
| HPAXK2a | EVQLVSGGGLVQPGSLRLSCAASGFTLS | S--SAMS | WVROAPGKLEWIS | VNSG--NGFSYIADSVKG |
| HPAXK2b | Q...L...V...T...T... | --- | --- | ---VH3 |
| HPAXK2c | Q...L...V...T...T... | --- | --- | ---VH3 |
| HPAXK2d | Q...L...V...T...T... | --- | --- | ---VH3 |
| HPAXK2e | Q...L...V...T...T... | --- | --- | ---VH3 |
| HPAXK3a | EVQLVSGGGLVQPGSLRLSCAASGFTFS | S--SAMS | WVROAPGKLEWIS | VISG--NGFSYIADSVKG |
| HPAXK3b | Q...L...V...T...T... | --- | --- | ---VH3 |
| HPAXK4a | QMLVQSGAEVKKPGASVKVSCKASGYTFS | D--YPMH | WVROAPGEGLEWNG | LVNP--TNGYTAYAPKFG |
| HPAXK4b | Q...L...V...T...T... | --- | --- | ---VH1 |
| HPAXK5 | QVQVQSGAEVKKPGASVKVSCKASGYTFT | S--YGIC | WVROAPGQGLEWNG | WIST--YNGNTNYAOKLOG |
| HPAXK6 | EVQLVSGGGLVQPGSLRLSCAASGFTFR | N--YAMS | WVROPPGKLEWNT | ALSG--DVVDYIADSVKG |
| HPAXK7a | QVQLQESGGGLVQPKSETLSLTCTVSGGSIS | SLMYFWG | WIRQPPGKLEWIG | SIY---YSGTAYINPFLRS |
| HPAXK7b | Q...L...V...T...T... | --- | --- | ---VH4 |
| HPAXK7c | Q...L...V...T...T... | --- | --- | ---VH4 |
| HPAXK7d | Q...L...V...T...T... | --- | --- | ---VH4 |
| HPAXK7e | Q...L...V...T...T... | --- | --- | ---VH4 |
| HPAXK8 | QMLVQSGGLVLAEGGSLRLSCAVSGLTEN | N--ANMN | WVROAPRGLECVG | RIKSKIDGGTTDYATPVKG |
| HPAXK9a | EVQLVSGGGLVQPGSLRLSCAASGFTFS | R--YTLS | WVROAPGKLEWIS | YIST--DGSTIYADSVKG |
| HPAXK9b | Q...L...V...T...T... | --- | --- | ---VH3 |
| HPAXK10 | EVQLVQSGAEVKKPGASVKVSCKASGYSET | A--YMH | WVROAPGQGLEWNG | WITP--DNGRTNYAQQFOR |
| HPAXK11 | QVQLVSGGVVQPGSLRLSCAASGFTFD | D--YAMH | WVROVPKLEWIS | LISW--DAISTYIADSVKG |

| Fab | framework 3 | DH | JH | CDR3 |
|----------|-----------------------------------|------------------------------------|------------------------|-----------------------|
| HPBAXK1a | RFSISRDNKNSLYLQMSLRDEDTAVYYCAR | VFFVEGS | -----YWSFDLWGRGTLVTVSS | JH2 (Seq. ID No. 83) |
| HPBAXK1b | ..... | ..... | ..... | JH2 (Seq. ID No. 84) |
| HPBAXK1c | ..... | ..... | ..... | JH2 (Seq. ID No. 85) |
| HPBAXK1d | ..... | ..... | ..... | JH2 (Seq. ID No. 86) |
| HPBAXK2a | RFSISRDNKNTVYLEMSLRAEDTAKYYCVK | VKYGSRSHF | -----FDRWGQGTTLVTVSS | JH5 (Seq. ID No. 87) |
| HPBAXK2b | ..... | ..... | ..... | JH5 (Seq. ID No. 88) |
| HPBAXK2c | ..... | ..... | ..... | JH5 (Seq. ID No. 89) |
| HPBAXK2d | ..... | ..... | ..... | JH5 (Seq. ID No. 90) |
| HPBAXK2e | ..... | ..... | ..... | JH5 (Seq. ID No. 91) |
| HPBAXK3a | RFSISRDNKNTLYLQMSLRRAEDTAETYYCAN | VKYGSGSHF | -----WFDPWGQGTTLVTVSS | JH5 (Seq. ID No. 92) |
| HPBAXK3b | ..... | .....TK | ..... | JH5 (Seq. ID No. 93) |
| HPBAXK4a | RVTWTRQRTSTVYMLSLRSRSEDATVYFCAR | VRSSDSI | -----DAPDINGQGTMTVYSS | JH3 (Seq. ID No. 94) |
| HPBAXK4b | ..... | .....K | ..... | JH3 (Seq. ID No. 95) |
| HPBAXK5 | RVTMTDTSTSTAYMELSLRSDTAVYYCAR | AWPPRGSSQLDR | ---GOYFOHWGQGTTLVTVSS | JH1 (Seq. ID No. 96) |
| HPBAXK6 | RFLISRDNKNTVYLEMSSLRRAEDTAVYYCAK | DYCAVDILTGLDYQYGVNDVWGQGTTLVTVSS | JH6 (Seq. ID No. 97) | |
| HPBAXK7a | RATISVDTSKNQLSKLMSVTAADTAVYYCAR | PSSFYFNGRTSYYPGET-AFEIWGQGTTLVAVSS | JH3 (Seq. ID No. 98) | |
| HPBAXK7b | VaM.....S..... | T.Y.S.T.....A..D.....T..... | JH3 (Seq. ID No. 99) | |
| HPBAXK7c | VS.....R..... | A.....V..... | JH3 (Seq. ID No. 100) | |
| HPBAXK7d | VaM.....S..... | G.T.....A..D.....M..T..... | JH3 (Seq. ID No. 101) | |
| HPBAXK7e | V..... | ..... | JH3 (Seq. ID No. 102) | |
| HPBAXK8 | RFTISRDNKNTVYLEMSSLRRIEDTAVYYCTT | RNPWQSPAPW | -----DFWGGQGTTLVTVSS | JH4 (Seq. ID No. 103) |
| HPBAXK9a | RFTISRDNKNSLQMSLRDEDTAVYYCAR | VFFGGNFRA | -----HWYFDLWGRGTLVTVSS | JH2 (Seq. ID No. 104) |
| HPBAXK9b | ..... | ..... | ..... | JH2 (Seq. ID No. 105) |
| HPBAXK10 | RITVTSDDTSINTVYLEMSSLRSDDTAVYYCYR | SGWSQF | -----LDYWGQGTTLVTVSS | JH4 (Seq. ID No. 106) |
| HPBAXK11 | RFTISRDNKNTFYLDMSLTPEDTALYYCGK | DQGGFRLL | -----VDYWGQGTTLVTVSS | JH4 (Seq. ID No. 107) |

Fig 8a

| Fab | Clone | framework 1 | CDR1 | framework 2 | CDR2 |
|---------|-------|--|----------------------------|--------------------------|--------------------|
| HBPAK1a | 3A1 | ELVMTQSPAALSVSPGERATLSC | RASQSISS-----SLA | WYQKPGQAPRLLIY | AASRAT VK3 |
| HBPAK1b | 3A2 |T..... |V.....N | ..... | G..... VK3 |
| HBPAK1c | 3A3 |F.....T.....A..... |TNN-----DV |R.....G.....F | GT.....P VK3 |
| HBPAK1c | 3A8 |T.....T.....S..... |N.....R.....N |S..... | G.....S VK3 |
| HBPAK1c | 3G6 |T.....T.....T..... |H.....V.....T..... | ..... | T.....A VK3 |
| HBPAK1d | 3C11 |T.....T.....T..... |S.....V.....N | ..... | G.....H VK3 |
| HBPAK1d | 3F4 |T.....T.....T..... |V.....V.....D | ..... | H..... VK3 |
| HBPAK2a | 3A4 |T.....T.....T..... |G.....G.....Y | ..... | G..... VK3 |
| HBPAK2b | 3A5 |L.....T.....A..... |VN-----N | ..... | G..... VK3 |
| HBPAK2c | 3A6 |T.....T.....T..... |V..... | ..... | G..... VK3 |
| HBPAK2c | 3B8 |T.....T.....V..... | G.....V.....N | ..... | MS..... VK3 |
| HBPAK2c | 3B10 |T.....T.....T..... |V.....N | ..... | G..... VK3 |
| HBPAK2c | 3E10 |T.....T.....D..... |V.....T.....N | ..... | GS..... VK3 |
| HBPAK2c | 3H9 |T.....T.....T..... |V..... | ..... | G..... VK3 |
| HBPAK2d | 3A9 |T.....T.....T..... |V.....N | ..... | G..... VK3 |
| HBPAK2d | 3A12 |T.....T.....T..... |V.....NL | ..... | G..... VK3 |
| HBPAK2d | 3B4 |T.....T.....EQ..... |V.....NL | ..... | D..... VK3 |
| HBPAK2d | 3C1 |T.....T.....T..... |V..... | ..... | G..... VK3 |
| HBPAK2d | 3D12 |T.....T.....T..... |V.....N | ..... | GT..... VK3 |
| HBPAK2e | 3G4 |VS.....EL.....V..... |VRG-----D | ..... | F..... VK3 |
| HBPAK3a | 3B1 |T.....T.....T..... |V.....T.....N | ..... | H..... VK3 |
| HBPAK3b | 3C6 | D.....T.....T.....EA..... |VN-----N | ..... | G..... VK3 |
| HBPAK4a | 3B3 | D.....ST.....A.....V.....D.....V.....IT |S..... |K.....K..... | Q.....SLOS VK1 |
| HBPAK4b | 3F2 | D.....QL.....ST.....A.....V.....D.....V.....IT |RD.....KT-----W |K.....K..... | D.....SLES VK1 |
| HBPAK5 | 3B6 |T.....T.....T..... |V..... | ..... | G..... VK3 |
| HBPAK6 | 3C7 |L.....GT.....L..... |V.....S.....Y | ..... | G..... VK3 |
| HBPAK7a | 3D1 |L.....GT.....L..... |VN.....K.....F |R.....P..... | G.....NT..... VK3 |
| HBPAK7b | 3D3 |GT.....GT.....L..... |V.....S.....Y | ..... | G.....S..... VK3 |
| HBPAK7b | 3F5 |L.....GT.....GT.....L..... |I..... | ..... | ST..... VK3 |
| HBPAK7c | 3D7 |L.....GT.....GT.....L..... |FGNN-----N | ..... | G.....S..... VK3 |
| HBPAK7d | 3E1 | D.....DS.....A.....L.....IN | KS.....VLYSSNNKN |P.....K..... | W.....ES VK4 |
| HBPAK7e | 3E8 |S.....S.....S..... |N..... | ..... | G..... VK3 |
| HBPAK8 | 3D9 | D.....DS.....L.....L.....N | KS.....NVLYSSNNKN |P.....K..... | W.....A.....ES VK4 |
| HBPAK9a | 3E3 |T.....T.....T..... |GV..... |Q..... | D.....N..... VK3 |
| HBPAK9b | 3E7 |L.....T.....T.....L..... |V.....G..... | ..... | D.....N..... VK3 |
| HBPAK9b | 3G5 |L.....T.....T.....L..... |V..... | ..... | D.....N..... VK3 |
| HBPAK10 | 3F10 | D.....M.....ES.....A.....L..... | KS.....T.....L.....SRNNQKY |A.....HP.....K..... | B.....S.....ES VK4 |
| HBPAK11 | 3G8 | D.....QL.....SS.....A.....V.....D.....VSIT |D.....N.....Y.....V | F.....K.....K.....KS |SLOQ VK1 |

Fig 8b

| | | | | | |
|---------|------|---------------------------------|---|-----|-------------------|
| HBPAK1a | 3A1 | GIPARFSGSGTGTEFTLTISLSQSEDFVYVC | QQYNNWP--ITFGGTRLEIR | JK5 | (Seq. ID No. 108) |
| HBPAK1b | 3A2 |A..... |K | JK5 | (Seq. ID No. 109) |
| HBPAK1c | 3A3 |DY.....S..... |P.....VDF..... | JK3 | (Seq. ID No. 110) |
| HBPAK1c | 3A8 |L..... |G.....KV..... | JK4 | (Seq. ID No. 111) |
| HBPAK1c | 3G6 |V..... |K.....V.....G.....KVDL..... | JK4 | (Seq. ID No. 112) |
| HBPAK1d | 3C11 |A..... |DK.....P.....N.....K | JK2 | (Seq. ID No. 113) |
| HBPAK1d | 3F4 |A..... |K.....P.....N.....K | JK2 | (Seq. ID No. 114) |
| HBPAK2a | 3A4 |C.....E..... |LA.....KV.....K | JK1 | (Seq. ID No. 115) |
| HBPAK2b | 3A5 |G.....E..... |H.....P.....KV.....K | JK1 | (Seq. ID No. 116) |
| HBPAK2c | 3A6 |K..... |L.....P.....KVD.....K | JK3 | (Seq. ID No. 117) |
| HBPAK2c | 3B8 |K..... |A.....L.....G.....KV.....K | JK4 | (Seq. ID No. 118) |
| HBPAK2c | 3E10 |T..... |P.....P.....KVD.....K | JK3 | (Seq. ID No. 119) |
| HBPAK2c | 3E10 |T..... |HA..... | JK5 | (Seq. ID No. 120) |
| HBPAK2c | 3H9 |K..... | ..... | JK5 | (Seq. ID No. 121) |
| HBPAK2d | 3A9 |K..... |P.....P.....KV.....K | JK1 | (Seq. ID No. 122) |
| HBPAK2d | 3A12 |K..... |N.....P.....KVD.....K | JK3 | (Seq. ID No. 123) |
| HBPAK2d | 3B4 |M.....G..... |D.....S..... | JK5 | (Seq. ID No. 124) |
| HBPAK2d | 3C1 |K..... |D.....G.....KV.....K | JK1 | (Seq. ID No. 125) |
| HBPAK2d | 3D12 |K..... |D.....L.....G.....KV.....K | JK1 | (Seq. ID No. 126) |
| HBPAK2e | 3G4 |SD..... |A.....PD.....A.....S..... | JK1 | (Seq. ID No. 127) |
| HBPAK3a | 3E1 |A..... |E.....P.....N.....K | JK2 | (Seq. ID No. 128) |
| HBPAK3b | 3C6 |K..... |D.....E..... | JK5 | (Seq. ID No. 129) |
| HBPAK4a | 3B3 |V.....S..... |SSYS.....GP.....L.....KV.....K | JK1 | (Seq. ID No. 130) |
| HBPAK4b | 3F2 |V.....S..... |YY.....K.....K.....K | JK2 | (Seq. ID No. 131) |
| HBPAK5 | 3B6 |K..... |D.....E..... | JK5 | (Seq. ID No. 132) |
| HBPAK6 | 3C7 |D..... |TM.....KV.....K | JK1 | (Seq. ID No. 133) |
| HBPAK7a | 3D1 |D..... |GSL.....RY.....K.....K | JK2 | (Seq. ID No. 134) |
| HBPAK7b | 3D3 |D..... |H.....GSS.....G.....V.....DVK | JK5 | (Seq. ID No. 135) |
| HBPAK7b | 3F5 |D..... |GSS.....P.....I..... | JK5 | (Seq. ID No. 136) |
| HBPAK7c | 3D7 |A..... |GSS.....F.....P.....KV.....FK | JK3 | (Seq. ID No. 137) |
| HBPAK7d | 3E1 |V.....D..... |GRP.....G.....KV.....K | JK4 | (Seq. ID No. 138) |
| HBPAK7e | 3E8 |DF..... |YST.....L.....G.....KV.....K | JK4 | (Seq. ID No. 139) |
| HBPAK8 | 3D9 |V.....D..... |HD.....Q.....KV.....FK | JK1 | (Seq. ID No. 140) |
| HBPAK9a | 3E3 |V..... |YST.....L.....G.....KV.....K | JK4 | (Seq. ID No. 141) |
| HBPAK9b | 3E7 |K..... |RS.....N.....G.....KV.....K | JK4 | (Seq. ID No. 142) |
| HBPAK9b | 3G5 |K..... |RS.....P.....G.....KV.....K | JK5 | (Seq. ID No. 143) |
| HBPAK10 | 3F10 |V.....S..... |YST.....S.....G.....KV.....K | JK4 | (Seq. ID No. 144) |
| HBPAK11 | 3G8 |V.....S..... |H.....K.....Y.....L.....G.....KV.....K | JK4 | (Seq. ID No. 145) |

Fig 8c

IgG lambda clones

Heavy chain

| Fab | framework 1 | CDR1 | framework 2 | CDR2 |
|-------|-------------|-----------------------------------|---------------------|--------------------|
| HBL1 | 3D11 | LEEVQLLESGGGLVHPGGSLRLSCAASGFRFG | SYAMS WYRQAPGKLEWVS | SISGSGDTIYYADSVRG |
| | 3C12 | LEEVQLLESGGGLVHPGGSLRLSCAASGFRFG | SYAMS WYRQAPGKLEWVS | SISGSGDTIYYADSVRG |
| | 3D9 | LEEVQLLESGGGLVHPGGSLRLSCAASGFRFG | SYAMS WYRQAPGKLEWVS | SISGSGDTIYYADSVRG |
| HBL2a | 3B5 | LEEVQLLESGGGLVQPGGSLRLSCAASGFRFS | SYGMS WYRQAPGKLEWVS | SISGSGSTHYADSVRG |
| HBL2b | 3B8 | LEEVQLLESGGGLVQPGGSLRLSCAASGFRFT | SYGMS WYRQAPGKLEWVS | SISGNGRIYYADSVRG |
| | 3C6 | LEEVQLLESGGGLVQPGGSLRLSCAASGFRFT | SYGMS WYRQAPGKLEWVS | SISGNGRIYYADSVRG |
| HBL2c | 3B9 | LEEVQLLESGGGLVQPGGSLRLSCAASGFRFS | SYGMS WYRQVPGKLEWVA | SISGNGRIYYADSVRG |
| HBL2d | 3C4 | LEEVQLLESGGGLVQPGGSLRLSCAASGFRFS | SYGMS WYRQVPGKLEWVA | SISGNGRIYYADSVRG |
| HBL3 | 3B10 | LEQVQLVESGGGVQPGGSLRLSCAASGFRTPR | NYGMH WYRQAPGKLEWVA | YILYDGSKKIYYVDSVRG |
| HBL4a | 3C11 | LEQVQLVESGGGVQPGGSLRLSCAASGFRFS | SYGMH WYRQAPGKLEWVA | SISSDATKKNYADSVRG |
| | 3D6 | LEQVQLVESGGGVQPGGSLRLSCAASGVRFS | SYGMH WYRQAPGKLEWVA | SISSDATKKNYADSVRG |
| HBL4b | 3E5 | LEQVQLVQSGGGVQPGGSLRLSCAASGVTFR | SYGMH WYRQAPGKLEWVA | FVSSDGNKKNYADSVRG |
| HBL4c | 3E8 | LEEVQLVESGGGVQPGGSLRLSCAASRLST | SYGMH WYRQAPGKLEWVA | SISSDGNKKNYADSVRG |
| HBL4d | 3E12 | LEQVQLVESGGGVQPGGSLRLSCAASGLTFS | SYGMH WYRQAPGKLEWVA | FISYDGNKKNYADSVRG |
| HBL5 | 3D1 | LEEVQLLESGGGLVQPGGSLRLSCAASGFRFG | SYAMS WYRQAPGKLEWIS | GIYTGQDITKYGDSVRG |
| HBL6 | 3F10 | LEEVQLLESGGGLVQPGGSLRLSCAASGFRSS | AYALS WYRQIPGKLEWVS | AISGGGSGTIYYADSVRG |
| HBL7 | 3G5 | LEQVQLVESGGGLVQPGGSLRLSCAASGFRTPS | RYDIH WYRQAPGKLEWVA | LISYDGMKSSADSVRG |

| Fab | framework 3 | DH | JH | CDR3 |
|-------|-------------|---------------------------------|--------------|----------------------------------|
| HBL1 | 3D11 | RFTISKDSSRNTLFLQNSLRVDDTAIVYCAK | GSIFGTAKVYG | VDYWGQGLVTVSS (Seq. ID No. 146) |
| | 3C12 | RFTISKDSSRNTLFLQNSLRVDDTAIVYCAK | GSIFGTAKVYG | VDYWGQGLVTVSS (Seq. ID No. 147) |
| | 3D9 | RFTISKDSSRNTLFLQNSLRVDDTAIVYCAK | GSIFGTAKVYG | VDYWGQGLVTVSS (Seq. ID No. 148) |
| HBL2a | 3B5 | RFTISRDNKNTLYLQMSLRADTAIVYCAK | DGYGSGLFYG | MDVWGQGTTVTVSS (Seq. ID No. 149) |
| HBL2b | 3B8 | RFTISRDNKNTLYLQMSLRADTAIVYCAK | DGYGSGVFYG | MDVWGQGTTVTVSS (Seq. ID No. 150) |
| | 3C6 | RFTISRDNKNTLYLQMSLRADTAIVYCAK | DGYGSGVFYG | MDVWGQGTTVTVSS (Seq. ID No. 151) |
| HBL2c | 3B9 | RFTISRDNKNTLYLQMSLRADTAIVYCAK | DGYGSGSFYG | IDVWGQGTTVTVSS (Seq. ID No. 152) |
| HBL2d | 3C4 | RFTISRDNKNTLYLQMSLRADTAIVYCAK | DGYGSGLLYG | IDVWGQGTTVTVSS (Seq. ID No. 153) |
| HBL3 | 3B10 | RFTVSRDNKNTLYLQMSLRPETAIVYCVK | DGLLAGGYEGG | FDYWGQGLVTVSS (Seq. ID No. 154) |
| HBL4a | 3C11 | RFTISRDNKNTLHLQMTLRPETAIVYCAK | TDILGPAIEFG | LDYWGQGLVTVSS (Seq. ID No. 155) |
| | 3D6 | RFTISRDNKNTLHLQMTLRPETAIVYCAK | TDILGPAIEFG | LDYWGQGLVTVSS (Seq. ID No. 156) |
| HBL4b | 3E5 | RFTISRDNKNTLYLQMSLRREDTAIVYCAK | TDILGPAIEFG | LDYWGQGLVTVSS (Seq. ID No. 157) |
| HBL4c | 3E8 | RFTISRDNKNTLYLQMSLRREDTAIVYCAK | TDILGPAIEFG | LDYWGQGLVTVSS (Seq. ID No. 158) |
| HBL4d | 3E12 | RFTISRDNKNTLYLQMSLRREDTAIVYCAK | TDILGPAIEFG | LDYWGQGLVTVSS (Seq. ID No. 159) |
| HBL5 | 3D1 | RFTISRDNKNTLYLQMSLRREDTAIVYCAK | SAYVVSISYVG | FDYWGQGTTRTVSS (Seq. ID No. 160) |
| HBL6 | 3F10 | RFTISRDNKNTLYLQMSLRGEDTAIVYCAT | GNVGRNVQNMWY | FDLWGRGTLVTVSS (Seq. ID No. 161) |
| HBL7 | 3G5 | RFTVSRNSRNTVFLQMSGLRPETAIVYFCAK | SDVMARARGSG | FDVWGQGTTVTVSS (Seq. ID No. 162) |

Fig 8d

Light chain

| Fab | | framework 1 | CDR1 | framework 2 | CDR2 |
|-------|------|---------------------------|-------------|---------------|---------|
| HBL1 | 3D11 | SRSYELTQPPSVSVAPGQTARITC | GGNTIGSQSVH | WYQKPGQAPLVVY | DDSDRPS |
| | 3C12 | SRSYVLTQPPSVSVAPGQTASITAC | GGNNIGSKSVH | WYQKPGQAPLVVY | DDTDRPS |
| | 3D9 | SRSYELTQPPSVSVAPRTDQITC | GEDKIESKSVH | WYQKPGQAPLVVY | DDSDRPS |
| HBL2a | 3B5 | SRLFVLTQPPSVSVAPGQTARITC | GGNNIGSKSVH | WYQKPGQAPLVVY | DDNERPS |
| HBL2b | 3B8 | SRSYVLTQPPSVSVAPGQTARITC | GGDSIGSKSVH | WYQKPGQAPLVVY | DDSDRPS |
| | 3C6 | SRSYVLTQPPSVSVAPGQTARITC | GGNNIGSKSVH | WYQKPGQAPLVVY | DDSDRPS |
| HBL2c | 3B9 | SRSYELTQPPSVTVVPGQTARITC | GGNNIGSRSVH | WYQKPGQAPLVVY | DDSDRPS |
| HBL2d | 3C4 | SRLFVLTQPPSVSVAPGQTARITC | GGNNIGSKSVH | WYQKPGQAPLVVY | DDSDRPS |
| HBL3 | 3B10 | SRSYVLTQPPSVSVAPGQTAKLIC | GGNNIGAKSVQ | WYQKPGQAPLVVY | DDTERPS |
| HBL4a | 3C11 | SRSYVLTQPPSVSVAPGQTARITC | GGNNIGSKSVH | WYQKPGQAPLVVY | DDSDRPS |
| | 3D6 | SRSYVLTQPPSVSVAPGQTARITAC | GGDNIGIKTVQ | WYQKPGQAPLVVY | DDSDRPS |
| HBL4b | 3E5 | SRSYVLTQPPSVSVAPGQMARITC | GGNNIGRQSVN | WYQKPGQAPLVVY | DDSDRPS |
| HBL4c | 3E8 | SRSYELTQPPSVSVAPGQTARITC | GGNNIGSKSVH | WYQKPGQAPLVVY | DDSDRPS |
| HBL4d | 3E12 | SRLFVLTQPPSVSVAPGQTASITAC | GGNNIGSKSVH | WYQKPGQAPLVVY | DDNDRPS |
| HBL5 | 3D1 | SRSYVLTQPPSVSVAPGQTARITC | GGNSIGSKSVH | WYQKPGQAPLVVY | DDSDRPS |
| HBL7 | 3G5 | SRSYVLTQPPSVSVAPGQTARITC | GGNNIGSKSAH | WYQKPGQAPLVVY | DDSDRPS |

| Fab | | framework 3 | CDR3 | JL |
|-------|------|---------------------------------|---------------|-------------------------------|
| HBL1 | 3D11 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSSDH--- | VVFGGTRLTVL (Seq. ID No. 163) |
| | 3C12 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDASSDQPY- | VVFGGTRLTVL (Seq. ID No. 164) |
| | 3D9 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSSHH--- | VVFGGTRLTVL (Seq. ID No. 165) |
| HBL2a | 3B5 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSSDH--- | VVFGGTRLTVL (Seq. ID No. 166) |
| HBL2b | 3B8 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWHITSDHPN- | VVFGGTRLTVL (Seq. ID No. 167) |
| | 3C6 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVMDTNNDH--- | VVFGGTRLTVL (Seq. ID No. 168) |
| HBL2c | 3B9 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSGDLDP- | VVFGGTRLTVL (Seq. ID No. 169) |
| HBL2d | 3C4 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSSDH--- | VVFGGTRLTVL (Seq. ID No. 170) |
| HBL3 | 3B10 | AIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSDH--- | VVFGGTRLTVL (Seq. ID No. 171) |
| HBL4a | 3C11 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSSDP--- | VVFGGTRLTVL (Seq. ID No. 172) |
| | 3D6 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSGDHP--- | VVFGGTRLTVL (Seq. ID No. 173) |
| HBL4b | 3E5 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSSDH--- | VVFGGTRLTVL (Seq. ID No. 174) |
| HBL4c | 3E8 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSSSDHL--- | VVFGGTRLTVL (Seq. ID No. 175) |
| HBL4d | 3E12 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSTSDHPY- | VVFGGTRLTVL (Seq. ID No. 176) |
| HBL5 | 3D1 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDSTGDR--- | VVFGGTRLTVL (Seq. ID No. 177) |
| HBL7 | 3G5 | GIPERFSGNSGNTATLTISRVEAGDEADYYC | QVWDGTGDHP--- | VVFGGTRLTVL (Seq. ID No. 178) |

HBL2d 3C4 had a "tga" stop codon in CDR1 as indicated by "J".

Fig 8e

Mouse IgG kappa clones to IgE Fc

Heavy chain

| Fab | Framework 1 | | Framework 2 | | CDR2 |
|------------------|--------------------------|-------|----------------|-------------------|------|
| | CDR1 | CDR2 | CDR1 | CDR2 | |
| m2G1R2A8 | QSGAELMKPGASVKISKATDYTFS | NYWIE | WVKQRPGHGLEWIG | EILPGSGSTNFNEKFKG | |
| m2G1R2B9 |I.....RT..... | ..... | .....R..... |T.....R..... | |
| m2G1R2B11, C5 |V.....S..... | ..... | .....I..... |D.....R..... | |
| m2G1R2C2, F9, c3 |V.....S..... | ..... | ..... | .....D.....V..... | |
| m2G1R2C8 |V.....S..... | ..... | ..... | .....D.....V..... | |
| m2G1R2F12 |V.....S..... | ..... | ..... | .....D.....V..... | |
| m2G1R2G1, C11 |V.....S..... | ..... | ..... | .....T.....R..... | |
| m2G1R2H8 |V.....S..... | ..... | ..... | .....D.....V..... | |
| m2G1R2F7 |V.....S..... | ..... | ..... | .....D.....V..... | |
| m2G1R2D10 |V.....S..... | ..... | ..... | .....D.....V..... | |
| m2G1R2F10 |V.....S..... | ..... | ..... | .....D.....V..... | |
| m2G1R2H3 |V.....S..... | ..... | ..... | .....D.....V..... | |
| m2G1R2H7 |V.....S..... | ..... | ..... | .....D.....V..... | |
| m2G1R2a9 |V.....S..... | ..... | ..... | .....D.....V..... | |

| Fab | Framework 3 | | Framework 4 | | CDR3 | FR4 | Seq. | ID No. | Seq. | ID No. |
|------------------|--------------------------|----------|-------------|----------------|--------|--------|--------|--------|--------|--------|
| | CDR1 | CDR2 | CDR1 | CDR2 | | | | | | |
| m2G1R2A8 | KATFTADTSSNTAYMQLSSLTSED | SAVYYCAR | AYFTFS | LDYWGQGTTLTVSS | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2B9 |Y..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2B11, C5 |Y..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2C2, F9, c3 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2C8 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2F12 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2G1, C11 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2H8 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2F7 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2D10 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2F10 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2H3 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2H7 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |
| m2G1R2a9 |L..... | ..... | ..... | ..... | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) | (Seq.) |

Fig. 9a

Mouse IgG lambda clones to IgE Fc

Heavy chain

| Fab | Framework 1 | CDR1 | Framework 2 | CDR2 |
|------------|-----------------------------|--------------|-----------------|----------------------|
| m3G1R3A11 | GAELMKPGASVKISCKATGYTFN | TYWIE | WVKQRPBGHGLEWIG | EILPGTDNTNYNEKFKG |
| m3G1R3A12 | ..... | ..... | ..... | ..... |
| m3G1R3D12 | ..... | ..... | ..... | ..... |
| m3G1R3G8 | ..... | ..... | ..... | ..... |
| m3G1R3E9 | ..... | ..... | .....R..... | ..... |
| m3G1R3B10 | GAELMKPGASVKISCKATGYTLS | SYWIE | WVKQRPBGHGLEWIG | EILPGSDNTNYNEKFKG |
| m3G1R3B11 |LS..... | S..... | ..... | .....S..... |
| m3G1R3F11 |LS..... | S..... | ..... | .....S..... |
| m3G1R3H9 |LS..... | S..... | ..... | .....S..... |
| m3G1R3E7 | LVDPGGLVQPGGSLRLSCE TSGFTFT | DY YLS | WVRQPPGKALEWLG | FIRNKANGYTT EYSASVKG |
| m3G1R3E10 | ..... | .....MT..... | ..... | ..... |
| m3G1R3F8 | ..... | .....LS..... | ..... | ..... |
| m3G1R3G9 | ..... | .....LS..... | ..... | ..... |
| m3G1R3B7 | GT ELMKPGASVKISCRATGYTFS | DY WIE | WVKQRPBGHGLEWIG | EILPGSGDTNYNEKFKG |
| m3G1R3C7 | •T.....R.....S | D..... | ..... | .....SGD..... |
| m3G1R3G12 | •T.....R.....S | D..... | ..... | .....SGD..... |
| m3G2aR3C8 | QLQQS•T.....R.....S | D..... | ..... | .....SGD..... |
| m3G2aR3H7 | •T.....S.....S | S.....Y..... | ..... | .....SGD..... |
| m3G2aR3B10 | GGGLVQPGNSLRLSCATSGFTFT | DY YLS | WVRQPPGKALEWLG | FIRNKNGYTT EYSASVKG |
| m3G2aR3E10 | ..... | ..... | ..... | ..... |
| m3G2aR3D8 |S..... | ••••M• | ..... | .....A•• |
| m3G2aR3D4 | HQQSGAELMKPGASVKISCKSTGYTFS | SY WIE | WIKQRPBGHGLEWIG | EILPGSGFTNYNENFKG |
| m3G2aR3B4 |A..... | ..... | ..... | ..... |

Fig. 9b

| Fab | Framework 3 | | | CDR3 | FR4 | | |
|------------|---------------------------|----------------|----------------------|----------------|--------|--------|------|
| m3G1R3A11 | KATFTADTSSNTAYMQLSSLTSEDS | SAVYYCAR | QVGLRWF | FDYWGQGTTLTVSS | (Seq. | ID No. | 247) |
| m3G1R3A12 | ..... | ..... | ..... | ..... | (Seq. | ID No. | 248) |
| m3G1R3D12 | ..... | ..... | ..... | ..... | (Seq. | ID No. | 249) |
| m3G1R3G8 | ..... | ..... | ..... | ..... | (Seq. | ID No. | 250) |
| m3G1R3E9 | ..... | ..... | ..... | ..... | (Seq. | ID No. | 251) |
| m3G1R3B10 | KATFTADTSSNIAYMQLSSLTSEDS | SAVYYCAR | QVGLRWY | FDYWGQGTTLTVSS | (Seq. | ID No. | 252) |
| m3G1R3B11 |I..... | ..... | .....Y | ..... | (Seq. | ID No. | 253) |
| m3G1R3F11 |I..... | ..... | .....Y | ..... | (Seq. | ID No. | 254) |
| m3G1R3H9 |I..... | ..... | .....Y | ..... | (Seq. | ID No. | 255) |
| m3G1R3E7 | RFTISRDDSQSILYLQMN | TLRAEDSATYYCLR | NGRPYYALDYWGQTSVSVSS | (Seq. | ID No. | ID No. | 256) |
| m3G1R3E10 | ..... | .....S | ..... | ..... | (Seq. | ID No. | 257) |
| m3G1R3F8 | ..... | .....S | ..... | ..... | (Seq. | ID No. | 258) |
| m3G1R3G9 | ..... | .....L | ..... | ..... | (Seq. | ID No. | 259) |
| m3G1R3B7 | KATFTADTSSNTAYMQLSSLTSEDS | SAVYYCAR | GLWLRGYF | FDYWGQGTTLTVSS | (Seq. | ID No. | 260) |
| m3G1R3C7 | ..... | ..... | GLW...GY... | ..... | (Seq. | ID No. | 261) |
| m3G1R3G12 | ..... | ..... | GLW...GY... | ..... | (Seq. | ID No. | 262) |
| m3G2aR3C8 | ..... | ..... | GLW...GY... | ..... | (Seq. | ID No. | 263) |
| m3G2aR3H7 | ..... | ..... | GLW...GY... | ..... | (Seq. | ID No. | 264) |
| m3G2aR3B10 | RFTISRDDSQSILYLQMN | TLRAEDSATYYCAR | HGRPYYLMDYWGQTSVTVSS | (Seq. | ID No. | ID No. | 265) |
| m3G2aR3E10 | ..... | ..... | ..... | ..... | (Seq. | ID No. | 266) |
| m3G2aR3D8 | ..... | ..... | ..... | ..... | (Seq. | ID No. | 267) |
| m3G2aR3D4 | KVTFTADTSSNTAYMQFSSLTSEDS | SAVYYCAT | TTVVVRDYL | DYWGQGTTLTVSS | (Seq. | ID No. | 268) |
| m3G2aR3B4 |S..... |L..... | ..... | ..... | (Seq. | ID No. | 269) |

Fig. 9c

Kappa light chain

| Fab | Framework 1 | CDR1 | Framework 2 | CDR2 |
|------------|---------------------------|-------------|-----------------|----------|
| m3G1R3B10 | SRQIVLTQSPAIMASPGKEKVTWTC | SASSSVSYMH | WYQQKSSTSPKLWIY | DTSKLAS |
| m3G1R3H9 | ..... | ..... | ..... | ..... |
| m3G1R3B7 | SRQIVLTQSPAIMASPGKEKVTWTC | SASSSVNYMH | WYQQKSGTSPKRWIY | DTSKLTSS |
| m3G1R3C7 | ..... | ..N..S... | ..... | .....A.. |
| m3G1R3D12 | SRQIVLTQSPAIMASPGKEKVTWTC | SASSSVSYMH | WYQQKSSTSPKLWIY | DTSKLAS |
| m3G1R3E9 | ..... | ..... | ..... | ..... |
| m3G1R3E7 | SRDIQMTQSPASLSASVGETVTITC | RASENINSYLA | WFQQKQKSPQLLVY | DAKTLAE |
| m3G2aR3D8 | ..... | ..... | ..... | ..... |
| m3G2aR3E10 | ..... | ..... | ..... | ..... |

| Fab | Framework 3 | CDR3 | FR4 | (Seq. ID No. |
|------------|----------------------------------|------------|-------------|-------------------|
| m3G1R3B10 | GVPGRFSGSGSGNSYSLTISSEAEADVATYYC | FQSGGYP LT | FGAGTKLEIKR | (Seq. ID No. 270) |
| m3G1R3H9 | ..... | ..... | ..S.....I.. | (Seq. ID No. 271) |
| m3G1R3B7 | GVPARFSGSGSGTSYSLTISSEAEADAATYYC | QQWNRNP PT | FGGGTKLEIKR | (Seq. ID No. 272) |
| m3G1R3C7 | ..... | ..... | ..... | (Seq. ID No. 273) |
| m3G1R3D12 | GVPGRFSGSGSGNSYSLTISSEAEADVATYYC | FQSGGYP LT | FGSGTKLEIKR | (Seq. ID No. 274) |
| m3G1R3E9 |T..... | ..... | ..... | (Seq. ID No. 275) |
| m3G1R3E7 | GVPGRFSGSGSGTQFSLKINSIQPEDFGSYVC | QHHYGIP LT | FGAGTKLEIKR | (Seq. ID No. 276) |
| m3G2aR3D8 | ..... | ..... | ..... | (Seq. ID No. 277) |
| m3G2aR3E10 | ..... | ..... | ..... | (Seq. ID No. 278) |

Fig. 9d